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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/619,531
Filing Date: July 19, 2000
Appellant(s): GROH ET AL.

George F. Lesmes
For Appellant

EXAMINER'S ANSWER

(1) Real Party in Interest

This is in response to the appeal brief filed January 31st, 2005.A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Claims Appealed

A substantially correct copy of appealed claims 1-11,13,14, and 15 appears on pages 1-3 of the Appendix to the appellant's brief. The minor errors are as follows: Claim 13 is not rejected over the prior art made of record. Claim 13 is objected as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

(7) Prior Art of Record

5,616,395	Baravian et al.	04-1997
6,235,657	Schops et al.	05-2001
RE 33,023	Heirs	08-1989
5,171,629	Heidel et al.	12-1992

4,816,327	Binnersley et al.	03-1989
5,571,596	Johnson	11-1996

(8) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

1. Claims 1 and 3-11 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Baravian et al., US 5,616,395 in view of Schops et al., US 6,235,657 and further in view of Hiers, RE 33,023.

The patent issued to Baravian et al., teaches a two-layer textile reinforcement comprising a thermostabilized consolidated non-woven first base layer needled to a second mineral fiber layer, which may in the form of a grid, scrim or cloth of continuous or discontinuous mineral filaments (Abstract). Baravian et al., teaches the application of heat to consolidate the non-woven and preferably comprises a sheet of continuous filaments of a thermoplastic synthetic polymer, having no binder fibers, such as a polyester, co-polyester, or polyamide (Column 2, 63-65 and Column 3, 45-55). With regard to claim 3, Baravian et al., teaches a non-woven sheet of polyolefin filaments, which is calendared under heat and pressure to achieve the desired shrinkage and density (Column 4, 45-57). With regard to claim 4, the specification indicates that the synthetic fibers may be pre-consolidated after formation of the non-woven. Applicant has not limited when the heat shrinking of the fibers takes place just that it occurs. Thus, without such limitations, it is the position of the Examiner that calendaring a synthetic non-woven sheet under heat and pressure would effectively heat shrink the fibers comprising the non-woven layer.

With regard to claims 5,9 and 10, Baravian et al., teaches consolidating the first layer by mechanical needling (Column 4, 45-48).

With regard to claims 6,9, and 10 Schops et al., teaches needling at about 20-70 stitches/ cm^2, evidencing that this needling stitch range is known in the art (Schops et al., Abstract).

The second mineral layer preferably takes the form of a scrim of mineral fibers formed by wet or dry non-woven processes, more particularly discontinuous glass fibers with chemical or thermal bonding (Column 3, line 65-Column 3, line 5). In this case, chemical bonding is interpreted as any type of resinous based binder.

Baravian et al., does not expressly teach end consolidating with a binder, however, the patent issued to Schops et al., discloses needling together a three layer laminate comprising two synthetic spunbonded layers and at least one reinforcing layer disposed between the two synthetic layers (Abstract and figure 1). The laminate may also be further end consolidated with a chemical binder such as polyvinyl alcohol (PVA) or butadiene-styrene copolymers (Column 5, lines 17-18).

Therefore, motivated to provide added durability and strength to the final laminate it would have been obvious to one having ordinary skill in the art at the time the invention was made to further consolidate the laminate of Baravian et al., with the chemical binders taught by Schops et al.

With regard to claim 11 Baravian et al., fails to teach two non-woven layers however, the patent issued to Schops et al., discloses needling together a three layer laminate comprising two synthetic spunbonded layers and at least one reinforcing layer disposed between the two synthetic layers (Abstract and figure 1). The spun-bonded webs are made of continuous filaments composed of melt-spinnable materials such as polyester (Column 2, lines 30-40).

With regard to the titer factor, it is the position of the Examiner that said limitation constitutes a method limitation not shown to effectively manipulate the final glass woven product structure. As such, said limitation is not given patentable weight at this time. The burden is shifted to the Applicant to evidence otherwise.

Therefore, motivated to provide multi-layer composite having added strength, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the teachings of Schops et al., and form the composite of Baravian et al., with two synthetic non-woven layers.

With respect to claims 7 and 8, Schops et al., lacks an explicit teaching as to the amount of polyvinyl alcohol (PVA) or butadiene-styrene copolymer binders, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the amount of binder used to end-consolidate the laminate as a function of desired durability, cohesion and strength. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum value of a results effective variable involves only routine skill in the art. *In re Boesch 272, 205 USPQ 215 (CCPA 1980)*

With respect to the limitation that a portion of the fibers of the synthetic non-woven layer passes through the non-woven mineral layer, Baravian et al., teaches needling the first and second base layer together, the Examiner asserts that a portion of fibers from the first layer would inherently pass to the second layer. While the Examiner concedes that the degree of needling is not specifically, taught, it is widely known in the art to vary the depth of penetration as function of mechanical strength and composite integrity. For Example, the patent issued to Hiers teaches needling a glass fiber batt and an organic fiber batt together to form a composite

such that resulting layers are substantially non-detachable from each other and from an integral composite fabric (Column 4, 39-45). The Examiner would also like to call attention to figure 2 of the Hiers patent, which clearly illustrates needle penetration through all of the layers such that the layers are bound together at the respective inner surfaces (Figure 2, Column 5, 20-35). Therefore, motivated by the desire to from a composite having sufficient mechanical strength and integrity, it would have been obvious to one having ordinary skill in the art at the time the invention was made to needle the layers in the invention of Baravian et al., and Schops et al., such that that resulting layers are substantially non-detachable from each other and form an integral composite fabric as taught by Hiers.

2. Claim 2 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Baravian et al., US 5,616,395 in view of Schops et al., US 6,235,657 and in view of Hiers, RE 33,023 as applied to claim 1 above and further in view of Heidel et al., US 5,171,629.

The combination of prior art fails to teach a specific chemical binder suitable for pre-consolidating the glass faberic, however, the patent issued to Heidel et al. needling a glass fiber mat and synthetic fiber mat . Heidel et al. teaches pre-consolidating the glass fiber mat with polymer binders or melamine resins (Column 2, lines 14-17).

Therefore, motivated to provide a consolidated woven fabric layer, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the polymer binders or melamine resins taught by Heidel et al., to consolidate the glass fiber layer in the invention of Baravian et al., and Schops et al.

3. Claim 14 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Baravian et al., US 5,616,395 in view of Schops et al., US 6,235,657 and in view of Hiers, RE 33,023 as applied to claim 11 above and further in view of Binnersley et al., US 4,816,327.

The combination of prior art fails to teach employing weft tape yarns in the woven glass fabric, however, Binnersley et al. disclose woven fabrics male from impregnated glass fibers in which the weft yarns are tapes (column 2, 40-47). Binnersley et al., teaches that such a fabric exhibits conformity and uniformity, as it will remain parallel to the plane without twist. As result said woven fabric is highly suitable for use in laminates or molded parts (Column 4, 5-11).

Therefore, motivated by the conformity and uniformity properties, it would have been obvious to one having ordinary skill in the at the time the invention was made to substitute the the weft filaments in the mineral layer of Baravian et al., and Schops et al., with the weft tapes of Binnersley et al.

4. Claim 15 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Baravian et al., US 5,616,395 in view of Schops et al., US 6,235,657 and in view of Hiers, RE 33,023 as applied to claim 1 above and further in view of Johnson, US 5,571,596.

The combination of prior art fails to the type of glass fibers employed in the glass layer, however, the patent issued to Johnson teaches a roofing shingle including a plain woven E-glass fabric (column 7, 5-6). Johnson teaches that E-glass provides superior strength without increasing the thickness or weight of the shingle (Column 5, 43-47).

Therefore, motivated by the benefits imparted with the use of E-glass, it would have been obvious to one having ordinary skill in the art at the time invention was made to have employ the E-glass fibers of Johnson in the web of mineral scrim layer of Baravian et al., and Schops et al.

5. Claim 13 stands objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. With regard to claim 13, the combination of prior art fails to teach or fairly suggest the composite set forth in claim 1 specifically comprising a woven web of continuous glass filaments as warp yarns and glass staple fiber yarns as weft yarns.

(11) Response to Argument

1. Claims 1 and 3-11 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Baravian et al., US 5,616,395 in view of Schops et al., US 6,235,657 and further in view of Hiers, RE 33,023.

Applicant argues a lack of motivation to combine the references of Baravian et al., and Shops et al.

With regard to Applicant's argument that the laminates of Baravian et al., discloses that layers are adhesively bonded together, the Examiner respectfully points out that Baravian et al., teaches a two-layer textile reinforcement comprising a first thermostabilized consolidated non-woven base layer needled to a second mineral fiber layer, which may be in the form of a grid, scrim or cloth of continuous or discontinuous mineral filaments (Abstract). Applicant argues that said layers must be at least adhesively bonded when the glass layer is a grid or cloth and the layers must also be needled or seam knitted. Applicant further argues that the working examples only exemplify employing adhesive bonding. This argument is not persuasive. The Examiner submits that Baravian et al., clearly teaches needling the non-woven base layer with the second mineral layer and that adhesively bonding in addition to any needling operation is not precluded from Applicant's instant claim 1. In other words, though Baravian et al., may not exemplify

needling as a technique for joining the two layers together, to ignore the disclosure directed to needling either solely or addition to adhesive bonding would be improper.

With regard to the penetration limitations, the Examiner maintains that needling inherently passes fibers through the layers; however, in an effort to substantiate this supposition the Examiner relied upon Hiers, RE 33,023 as evidence. With regard to Applicant's assertion that the organic filaments, which penetrate the lower surface and lie adjacent thereto act to "interlock" or anchor the layers of the laminate, and also serve to anchor the binders used in the final consolidation to the laminate, the Examiner respectfully points out that Applicant has not recited such limitations. Thus the Examiner maintains that the needling structures illustrated by Heirs, RE 33,023 meet the presently claimed needling limitations. The Examiner would like to call attention to figure 2 of the Hiers patent, which clearly illustrates needle penetration through all of the layers such that the layers are bound together at the respective inner surfaces (Figure 2, Column 5, 20-35). Hiers teaches needling a glass fiber batt and an organic fiber batt together to form a composite such that resulting layers are substantially non-detachable from each other and from an integral composite fabric (Column 4, 39-45). Thus, the Examiner maintains that sufficient motivation exists to needle the layers in the invention of Baravian et al., and Schops et al., such that that resulting layers are substantially non-detachable from each other and form an integral composite fabric as taught by Hiers.

With regard to Applicant's arguments regarding final consolidation with a binder limitation, Applicant asserts that no motivation exists to finally consolidate the composite of Baravian et al., as taught by Schops et al. Applicant argues that consolidation only takes place in the non-woven layer of the Baravian et al., composite and to finally coat the composite with a

binder would render the composite of Baravian et al., unfit for its desired purpose. In response, though Baravian et al., does not explicitly state finally consolidating the composite with a binder, it is the position of the Examiner that there is nothing on record to evidence that doing so would negatively impact the intended final use. Support for said argument is found in the secondary reference of Schops et al., which teaches finally consolidating a composite, which is used in the same capacity as the Baravian et al., composite.

With respect to Applicant's argument that Schops et al., teaches a three layer laminate whereas Baravian et al., only teaches a two layer laminate, the Examiner respectfully points out that Baravian et al., clearly teaches either three or two layer reinforcement structures (Column 2, 7).

With regard to Applicant's arguments regarding the motivation to position a glass mineral layer between two outer organic fiber layers, it is respectfully pointed out that Hiers teaches a three layer structure comprising a glass batt disposed between two synthetic organic textile layers (Figure 2, Column 6, 5-17 and 60-69). Heirs specifically teach this three-layer arrangement to avoid the health risks associated with glass fiber breakage during the needling process (Column 3, 32-36, 55-58, and Column 45-28).

Therefore, the Examiner maintains that sufficient motivation exists to provide the three-layer arrangement taught by Heirs to prevent glass fiber breakage during needling. As such, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an additional synthetic non-woven layer to the composite of Baravian et al., in view of Schops et al., to form a three-layer structure as taught by Hiers.

2. Claim 2 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Baravian et al., US 5,616,395 in view of Schops et al., US 6,235,657 and in view of Hiers, RE 33,023 as applied to claim 1 above and further in view of Heidel et al., US 5,171,629.

With regard to the rejection of claim 2, the combination of prior art fails to teach a specific chemical binder suitable for pre-consolidating the glass fabric, however, the patent issued to Heidel et al. teaches needling a glass fiber mat and synthetic fiber mat. Heidel et al. teaches pre-consolidating the glass fiber mat with polymer binders or melamine resins (Column 2, lines 14-17).

Therefore, the Examiner maintains that it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the polymer binders or melamine resins taught by Heidel et al., to consolidate the glass fiber layer in the invention of Baravian et al., and Schops et al.

3. Claim 14 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Baravian et al., US 5,616,395 in view of Schops et al., US 6,235,657 and in view of Hiers, RE 33,023 as applied to claim 11 above and further in view of Binnersley et al., US 4,816,327.

With regard to the rejection of claim 14, the combination of prior art fails to teach employing weft tape yarns in the woven glass fabric, however, Binnersley et al. disclose woven fabrics male from impregnated glass fibers in which the weft yarns are tapes (column 2, 40-47). Binnersley et al., teaches that such a fabric exhibits conformity and uniformity, as it will remain parallel to the plane without twist. As result said woven fabric is highly suitable for use in laminates or molded parts (Column 4, 5-11).

Therefore, the Examiner maintains that it would have been obvious to one having ordinary skill in the at the time the invention was made to substitute the weft filaments in the mineral layer of Baravian et al., and Schops et al., with the weft tapes of Binnersley et al.

4. Claim 15 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Baravian et al., US 5,616,395 in view of Schops et al., US 6,235,657 and in view of Hiers, RE 33,023 as applied to claim 1 above and further in view of Johnson, US 5,571,596.

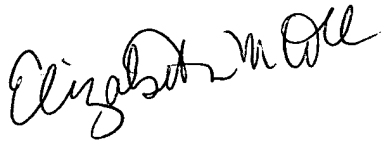
With regard to claim 15, the combination of prior art fails to teach the type of glass fibers employed in the glass layer, however, the patent issued to Johnson teaches a roofing shingle including a plain woven E-glass fabric (column 7, 5-6). Johnson teaches that E-glass provides superior strength without increasing the thickness or weight of the shingle (Column 5, 43-47).

Therefore, the Examiner maintains that it would have been obvious to one having ordinary skill in the art at the time invention was made to employ the E-glass fibers of Johnson in the web of mineral scrim layer of Baravian et al., and Schops et al.

5. Claim 13 stands objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. With regard to claim 13, the combination of prior art fails to teach or fairly suggest the composite set forth in claim 1 specifically comprising a woven web of continuous glass filaments as warp yarns and glass staple fiber yarns as weft yarns.

For the reasons given above, it is believed that the rejections should be sustained.

Respectfully submitted,



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March 21, 2005

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